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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,725	05/04/2001	Chien-Jen Chen	ONETTA-67	8417

7590

11/06/2002

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EXAMINER

SOMMER, ANDREW R

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/848,725

Applicant(s)

CHEN ET AL.

Examiner

Andrew R Sommer

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,12 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 12 and 15-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Allowable Subject Matter

The indicated allowable subject matter of claims 11, 12, and 15-17 is withdrawn in view of the newly discovered reference(s) to Ghera et al. ('922). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghera et al. ('922) (hereafter "Ghera") in view of Alexander et al. ('782) (hereafter "Alexander").

Regarding claims 1 and 12, Ghera teaches optical amplifier equipment that amplifies optical data signals in a fiber-optic communications link that has at least one span of transmission fiber for carrying the optical data signals, comprising: (1) a Raman pump that produces Raman pump light that creates Raman gain for the optical data signals in the span of transmission fiber (Fig. 2, 120); (2) an optical monitor that measures a first as well as any other backscattered pumping light from the span of transmission fiber (See Fig. 2, 290; column 7, lines 1-35; column 8, lines 21-31; column 7, lines 64-65 (describing a measuring step for pump light "at pump wavelengths")

(emphasis added)); and (3) a control unit that uses the Raman pump and the optical monitor to perform OTDR measurements on the transmission fiber (see *inter alia*, column 7). Ghera does not teach that the detector is a first and second monitor for detecting a first and second wavelength of pump light. However, Ghera does suggest such a modification in that the reference teaches monitoring more than one pump wavelength.

A second monitor for detecting a second wavelength in a multiwavelength signal light in a transmission system is taught in the Alexander reference. Alexander teaches a demultiplexer (54) for separating the WDM signal light into individual signal lights and using individual signal light monitors to detect the intensity of the lights supplied thereto. While this reference does not teach detecting pump light, one of ordinary skill in the art would have been led to utilize the detection system of Alexander as the detector of Ghera because such is an effective means of monitoring multiple wavelengths of light, as is well known in the art. It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to utilize the detector system of Alexander as the Ghera detector for detecting at least a first and second wavelength of pumping light because such would enable the detection of the multiple pump wavelengths, as is suggested in the Ghera reference.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghera in view of Alexander as applied to claim 1 above, and further in view of Emori et al. (Elect. Lett. 34:22 (1998)) (hereafter "Emori") (cited by Applicant in Paper No. 2).

Regarding claim 2, Ghera does not teach that the pumping sources comprise a plurality of laser diodes. Such are well known in the art to be effective Raman pump sources. Emori teaches a plurality of laser diodes for pumping a Raman amplifier. It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to utilize laser diodes as the plurality of laser sources in the Ghera Raman amplifier because such are well known in the art to provide ample pump light to Raman amplifiers, and are easily controllable.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghera in view of MacKichan ('404) (hereafter "MacKichan").

Regarding claim 15, Ghera does not teach that the control unit is configured to modulate the pumping light during the use of the optical data signals to carry normal data traffic on the span of transmission fiber. Ghera does teach that the OTDR process can be performed to characterize the transmission line during normal operation (see *inter alia*, Abstract). See also the discussion of claim 1, above, which is hereby incorporated by reference in its entirety. MacKichan teaches that a single pump wavelength is modulated to produce a series of pulses where the pulses are used to perform OTDR on the transmission system. It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modulate the pumping light of Ghera because such is well known in the art to result in an effective characterization of the back-reflected light from a transmission medium in OTDR-like measurements.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghera in view of MacKichan and Alexander.

Regarding claim 16, see the discussion of claims 1 and 15, which are hereby incorporated by reference in their entirety.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghera in view of Alexander, Park et al. ('706) (hereafter "Park") and MacKichan.

Regarding claim 17, see the discussion of claims 1 and 15, which are hereby incorporated by reference in their entirety. The combination of Ghera, Alexander and MacKichan do not teach that at least one of the pump sources is modulated with pulses that are 1- 500 ns in length and less than 5 kHz in frequency. Such modulation of pumping light is well known in the art and is taught in Park. Park teaches a Raman amplifier characterization system that utilizes modulated pumping light to characterize the transmission and amplification ability of a Raman amplifier. Specifically, Park teaches that the modulation should be between 10 Hz and 1000 Hz, which is a range which is below 5 kHz. See column 5, lines 38-39. Furthermore, a pulse duration of between 1 and 500 ns is well known in the art to be a reasonable pulse duration for system performance reasons. It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to further modify the Ghera amplifier to modulate the pump at a pulse duration of between 1 and 500 ns and at a frequency of 10 and 1000 Hz because such is well known in the art to allow for fast detection and

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monitoring of Raman amplifier properties, and would give the Ghera another means of characterizing the functionality of the optical amplifier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew R Sommer whose telephone number is (703) 605-4274. The examiner can normally be reached on M - F 7:00 - 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (703) 305-8233. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9326 for regular communications and (703) 872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

ars *ARS*
October 30, 2002

Thomas G. Black
THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600